

Complete Summary

GUIDELINE TITLE

Preservation of upper limb function following spinal cord injury: a clinical practice guideline for health-care professionals.

BIBLIOGRAPHIC SOURCE(S)

Consortium for Spinal Cord Medicine. Preservation of upper limb function following spinal cord injury: a clinical practice guideline for health-care professionals. Washington (DC): Paralyzed Veterans of America; 2005 Apr. 36 p. [149 references]

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Upper limb pain and injury following spinal cord injury (SCI)

GUIDELINE CATEGORY

Evaluation
Management
Prevention
Treatment

CLINICAL SPECIALTY

Family Practice
Internal Medicine
Neurology
Orthopedic Surgery
Physical Medicine and Rehabilitation

INTENDED USERS

Advanced Practice Nurses
Health Care Providers
Nurses
Occupational Therapists
Physical Therapists
Physician Assistants
Physicians
Psychologists/Non-physician Behavioral Health Clinicians

GUIDELINE OBJECTIVE(S)

To provide health-care professionals with concise, practical information that will help them prevent and treat upper limb pain and injury in their patients

TARGET POPULATION

Patients with spinal cord injury (SCI) who experience or may be at risk of upper limb pain and/or injury

INTERVENTIONS AND PRACTICES CONSIDERED

Patient Assessment

1. Evaluation of overall health status
2. Evaluation of transfer and wheelchair propulsion
3. Evaluation of equipment (wheelchair and transfer device)
4. Assessment of patients' use of complementary and alternative medicine

Prevention

1. Ergonomic modifications
2. Equipment selection and training
3. Environmental adaptations
4. Exercise
5. Education of patients and health-care providers

Treatment/Management

1. Management of acute and subacute upper limb injuries
 - Rest, including use of nightsplints (for carpal tunnel syndrome) and home modifications/assistance
 - Maintenance of range of motion
 - Hospital admission

- Rehabilitation
 - Monitoring of response to treatment
 - Surgery
2. Treatment of chronic musculoskeletal pain
- Interdisciplinary treatment incorporating multiple modalities, including pharmacotherapy, physical interventions, and psychological interventions
 - Monitor outcomes
 - Encourage use of power wheelchair

MAJOR OUTCOMES CONSIDERED

- Pain and other symptom relief
- Quality of life
- Incidence of upper limb injury and pain
- Functional capacity

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The methodology team affiliated with the Mt. Sinai School of Medicine conducted an extensive search of the literature, using Medline, CINAHL, Psychlit, and other bibliographic databases, using both indexed terms (Medical Subject Heading [MeSH] terms and similar) and text words appropriate to the subject matter. Initial searches included the terms spinal (cord) injury(ies), arm(s)/hand(s)/shoulder(s)/upper limb(s), and such terms as pain, strength(en)(ing), carpal tunnel syndrome, fracture(s), ergonomic(s)(ical), wheelchair propulsion, rotator cuff. All these searches were done with indexed terms "exploded" (so as to include key terms subsumed under the search terms) and were not limited to the English language. Additional searches were performed using more specialized text words or excluding the limitation to spinal cord injury, retrieving, for instance, the literature on biomechanics and risk factors for shoulder problems in industry.

For some of the searches, the abstracts (if available) were scanned for applicability by the methodology team and the ones retained sent to all or a subgroup of the panel members. For other searches, individual panel members did the scanning for relevance. To identify additional studies, panel members used their own libraries and the reference lists of papers found through database search and otherwise.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Strength of Study Rating Schema (Clinical/Epidemiologic Evidence)

1. Systematic review (or meta-analysis) of randomized trials
2. Randomized clinical trial (RCT)
3. Systematic review (or meta-analysis) of observational studies (case-control, prospective cohort, and similar strong designs)
4. Single observational study (case-control, prospective cohort, or similar strong designs)
5. Case series, pre-post study, cross-sectional study, or similar design
6. Case study, nonsystematic review, or similar very weak design

Strength of Ergonomic Evidence

For this guideline, the panel chair and two special consultants reviewed the ergonomics-based recommendations and graded them based on accepted principles of the biomechanical, physiological, psychophysical, and epidemiological ergonomics literature, as well as on standard ergonomic practices, using the following scale:

1. Strongly agrees with scientifically validated ergonomic principles
2. Somewhat agrees with scientifically validated ergonomic principles
3. Not supported by scientifically validated ergonomic principles

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Once the panel members had written their draft recommendations and the accompanying text providing the justification and other background information, the methodology team identified the papers and other materials (quoted or not) in support of the recommendations and submitted them to a detailed review to identify and extract the relevant evidence and evaluate the quality of the research project that was used to produce the evidence.

The methodology team selected the checklists of the Scottish Intercollegiate Guidelines Network (SIGN) (<http://www.sign.ac.uk/>) as the most appropriate and complete. SIGN offers checklists for four types of research design relevant to the present project:

1. Systematic reviews and meta-analyses

2. Randomized controlled trials
3. Cohort studies
4. Case-control studies

Because none of these checklists was appropriate for pre-post studies, case series studies, or cross-sectional studies, all of which are commonly used in the spinal cord injury (SCI) rehabilitation and outcomes literature, additional checklists were created by the team based on the template of SIGN. In addition, some items identified as important but missing in the SIGN checklists (e.g., mention of the funding source) were added to the seven checklists. The four modified and three supplemental checklists require the reviewer of methodology to answer questions on the internal validity, subject selection, randomization, confounding, outcomes assessment instruments, and other relevant aspects of the study being reviewed, leading to an overall assessment of the study quality as very strong (++), strong (+), or weak (-), within its category. This, in turn, leads to a conclusion whether the phenomenon reported in the paper (for instance, a change in patient status resulting from an intervention, a link between a risk factor and a particular outcome) is real or possibly an artifact of the study's methods and implementation.

The rankings of studies were adjusted downward for poor design or poor implementation of a study, and the methodology team did so based on the study quality scores.

If on the SIGN form a study was rated "+ +", it was given the number corresponding to its basic design. If it was rated "+", it was given one level less than its nominal rank, and two levels less was assigned if the quality rating was "-".

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The guideline development process adopted by the Consortium for Spinal Cord Medicine consists of 12 steps, leading to panel consensus and organizational endorsement. After the steering committee chooses a topic, a panel of experts is selected. Panel members must have demonstrated leadership in the topic area through independent scientific investigation and publication. Following a detailed explication and specification of the topic by select steering committee and panel members, consultant methodologists review the international literature, prepare evidence tables that grade and rank the quality of research, and conduct statistical meta-analyses and other specialized studies, as needed. The panel chair then assigns specific sections of the topic to the panel members based on their area of expertise. Writing begins on each component using the references and other materials furnished by the methodology support group.

After panel members complete their sections, a draft document is generated during the first full meeting of the panel. The panel incorporates new literature citations and other evidence-based information not previously available. At this

point, charts, graphs, algorithms, and other visual aids, as well as a complete bibliography, are added, and the full document is sent to legal counsel for review.

In addition to the grading of the clinical scientific literature reviewed for this guideline, an additional grading was added to the recommendations. Support for these particular recommendations depends highly on the science of ergonomics. For this guideline, the panel chair and two special consultants reviewed the ergonomics-based recommendations and graded them based on accepted principles of the biomechanical, physiological, psychophysical, and epidemiological ergonomics literature, as well as on standard ergonomic practices, using the "Strength of Ergonomic Evidence" scale described in the "Rating Scheme for the Strength of the Evidence" field. In each case, the ergonomic grade was reached by consensus, taking into account the differences in activities and surroundings (if any) between the industrial workers and their circumstances typically studied in ergonomics research and persons with spinal cord injury (SCI).

If there were multiple studies or multiple research traditions (clinical and ergonomic) supporting a recommendation, a next step was taken: evaluating the evidence as a whole. The methodology team used an approach based on that of the U.S. Preventive Services Task Force: The strength of the recommendation, taking into account the body of evidence overall and other factors, was rated as very strong (A), strong (B), intermediate (C), or weak (D), based on the following factors:

1. The number of studies and their size (the cumulative number of subjects)
2. The aggregate internal validity of the studies: how well a claim of a causal relationship was supported (aggregate quality of the "research design" in a narrow sense). The study strength hierarchy ratings from 1 to 6 were the major factor here.
3. The aggregate external validity (the representativeness of the samples studied to all persons with spinal cord injury to whom the particular recommendation applies). The Scottish Intercollegiate Guidelines Network (SIGN) checklists also provide information relevant to the issue of external validity or generalizability.
4. Coherence and consistency (the degree to which the findings of multiple studies were consistent, or if there were differences in findings, the degree to which the differences were plausible given variations in subjects, measures, or other relevant aspects)
5. The applicability of clinical research findings from studies of non-SCI groups to individuals with SCI
6. The ergonomics grading

See "Rating Scheme for the Strength of the Recommendations."

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Level A: Very Strong Support for Recommendation

- Multiple strong randomized controlled trials (RCTs) or a single strong systematic review of RCTs, and
- A great majority of studies in support of the recommendation, and

- Studies using subjects with spinal cord injury (SCI) or results clearly applicable to SCI

Level B: Strong Support for Recommendation

- Single large, strong RCTs or strong systematic review of observational studies or multiple weak RCTs or multiple strong observational studies (case control or cohort) and
- A majority of studies in support of the recommendation and
- Studies using subjects with SCI or results clearly applicable to SCI or
- Strong ergonomic principles support (grade 1)

Level C: Intermediate Support for Recommendation

- Multiple case series, pre-post studies or weak case-control or cohort study or single weak RCT and
- Studies using subjects with SCI or results clearly applicable to SCI, or
- Studies listed under level A or B above, and
- Applicability of studies to SCI unclear or more than just a single study reported contrary findings, or
- Agreement with ergonomics literature somewhat (grade 2)

Level D: Weak Support for Recommendation

- Qualitative reviews, case studies, weak cross-sectional studies or very weak studies of other design and no ergonomic support (grade 3)

In addition, each recommendation has a "strength of panel opinion" rating. Panel members reviewed the literature, discussed recommendations among themselves and with other professional colleagues, reviewed field reviewer comments and suggestions, and based on that information and their clinical experience, independently rated each recommendation on a 1-5 scale, where 1 reflected disagreement and 5 strong agreement. The "strength of panel opinion" rating reflects the mean of the individual panel member ratings.

Levels of Panel Agreement with the Recommendations (Strength of Panel Opinion)

Low - Mean agreement score 1.0 to less than 2.33

Moderate - Mean agreement score 2.33 to less than 3.67

Strong - Mean agreement score 3.67 to 5.0

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

After legal analysis to consider antitrust, restraint-of-trade, and health policy matters, the draft document is reviewed by clinical experts from each of the consortium organizations plus other select clinical experts and consumers. The review comments are assembled, analyzed, and entered into a database, and the document is revised to reflect the reviewers' comments. Following a second legal review, the draft document is distributed to all consortium organization governing boards. Final technical details are negotiated among the panel chair, members of the organizations' boards, and expert panelists. If substantive changes are required, the draft receives a final legal review. The document is then ready for editing, formatting, and preparation for publication.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Rating schemes for clinical/epidemiologic evidence (1-6), ergonomic evidence (1-3), grade of recommendation (A, B, C, D), and strength of panel opinion (Low, Moderate, Strong) are defined at the end of the "Major Recommendations" field.

Initial Assessment of Acute Spinal Cord Injury (SCI)

1. Educate health-care providers and persons with spinal cord injury (SCI) about the risk of upper limb pain and injury, the means of prevention, treatment options, and the need to maintain fitness.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--None; Grade of recommendation--Not Applicable (NA); Strength of panel opinion--Strong)

2. Routinely assess the patient's function, ergonomics, equipment, and level of pain as part of a periodic health review. This review should include evaluation of:

- Transfer and wheelchair propulsion techniques
- Equipment (wheelchair and transfer device)
- Current health status

(Clinical/epidemiologic evidence--None; Ergonomic evidence--None; Grade of recommendation--NA; Strength of panel opinion--Strong)

Ergonomics

3. Minimize the frequency of repetitive upper limb tasks.

(Clinical/epidemiologic evidence--4/5; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

4. Minimize the force required to complete upper limb tasks.

(Clinical/epidemiologic evidence--5/6; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

5. Minimize extreme or potentially injurious positions at all joints.
 - a. Avoid extreme positions of the wrist.

(Clinical/epidemiologic evidence--4/5; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

- b. Avoid positioning the hand above the shoulder.

(Clinical/epidemiologic evidence--6; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

- c. Avoid potentially injurious or extreme positions at the shoulder, including extreme internal rotation and abduction.

(Clinical/epidemiologic evidence--4/5; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

Equipment Selection, Training, and Environmental Adaptations

6. With high-risk patients, evaluate and discuss the pros and cons of changing to a power wheelchair system as a way to prevent repetitive injuries.

(Clinical/epidemiologic evidence--2/3; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

7. Provide manual wheelchair users with SCI a high strength, fully customizable manual wheelchair made of the lightest possible material.

(Clinical/epidemiologic evidence--2/5; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

8. Adjust the rear axle as far forward as possible without compromising the stability of the user.

(Clinical/epidemiologic evidence--2/3; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

9. Position the rear axle so that when the hand is placed at the top dead-center position on the pushrim, the angle between the upper arm and forearm is between 100 and 120 degrees.

(Clinical/epidemiologic evidence--2/3; Ergonomic evidence--2; Grade of recommendation--C; Strength of panel opinion--Strong)

10. Educate the patient to:

- a. Use long, smooth strokes that limit high impacts on the pushrim.

(Clinical/epidemiologic evidence--5; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

- b. Allow the hand to drift down naturally, keeping it below the pushrim when not in actual contact with that part of the wheelchair.

(Clinical/epidemiologic evidence--5; Ergonomic evidence--2; Grade of recommendation--C; Strength of panel opinion--Strong)

11. Promote an appropriate seated posture and stabilization relative to balance and stability needs.

(Clinical/epidemiologic evidence--2/3; Ergonomic evidence--NA; Grade of recommendation--C; Strength of panel opinion--Strong)

12. For individuals with upper limb paralysis and/or pain, appropriately position the upper limb in bed and in a mobility device. The following principles should be followed:

- a. Avoid direct pressure on the shoulder.
- b. Provide support to the upper limb at all points.
- c. When the individual is supine, position the upper limb in abduction and external rotation on a regular basis.
- d. Avoid pulling on the arm when positioning individuals.
- e. Remember that preventing pain is a primary goal of positioning.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

13. Provide seat elevation or possibly a standing position to individuals with SCI who use power wheelchairs and have arm function.

(Clinical/epidemiologic evidence--2/3; Ergonomic evidence--1; Grade of recommendation--B; Strength of panel opinion--Strong)

14. Complete a thorough assessment of the patient's environment, obtain the appropriate equipment, and complete modifications to the home, ideally to Americans with Disabilities Act (ADA) standards.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

15. Instruct individuals with SCI who complete independent transfers to:

- a. Perform level transfers when possible.

(Clinical/epidemiologic evidence--2/3; Ergonomic evidence--2; Grade of recommendation--C; Strength of panel opinion--Strong)

- b. Avoid positions of impingement when possible.

(Clinical/epidemiologic evidence--5; Ergonomic evidence--2; Grade of recommendation--C; Strength of panel opinion--Strong)

- c. Avoid placing either hand on a flat surface when a handgrip is possible during transfers.

(Clinical/epidemiologic evidence--2/5; Ergonomic evidence--3; Grade of recommendation--C; Strength of panel opinion--Strong)

- d. Vary the technique used and the arm that leads.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--2; Grade of recommendation--C; Strength of panel opinion--Strong)

- 16. Consider the use of a transfer-assist device for all individuals with SCI. Strongly encourage individuals with arm pain and/or upper limb weakness to use a transfer-assist device.

(Clinical/epidemiologic evidence--2/5; Ergonomic evidence--2; Grade of recommendation--C; Strength of panel opinion--Strong)

Exercise

- 17. Incorporate flexibility exercises into an overall fitness program sufficient to maintain normal glenohumeral motion and pectoral muscle mobility.

(Clinical/epidemiologic evidence--3/4; Ergonomic evidence--NA; Grade of recommendation--C; Strength of panel opinion--Strong)

- 18. Incorporate resistance training as an integral part of an adult fitness program. The training should be individualized and progressive, should be of sufficient intensity to enhance strength and muscular endurance, and should provide stimulus to exercise all the major muscle groups to pain-free fatigue.

(Clinical/epidemiologic evidence--3/6; Ergonomic evidence--NA; Grade of recommendation--C; Strength of panel opinion--Strong)

Management of Acute and Subacute Upper Limb Injuries and Pain

- 19. In general, manage musculoskeletal upper limb injuries in the SCI population in a similar fashion as in the unimpaired population.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--None; Grade of recommendation--NA; Strength of panel opinion--Strong)

- 20. Plan and provide intervention for acute pain as early as possible in order to prevent the development of chronic pain.

(Clinical/epidemiologic evidence--5/6; Ergonomic evidence--NA; Grade of recommendation--D; Strength of panel opinion--Strong)

21. Consider a medical and rehabilitative approach to initial treatment in most instances of nontraumatic upper limb injury among individuals with SCI.

(Clinical/epidemiologic evidence--5/6; Ergonomic evidence--NA; Grade of recommendation--D; Strength of panel opinion--Strong)

22. Because relative rest of an injured or postsurgical upper limb in SCI is difficult to achieve, strongly consider the following measures:

- a. Use of resting night splints in carpal tunnel syndrome

(Clinical/epidemiologic evidence--3/4; Ergonomic evidence--NA; Grade of recommendation--C; Strength of panel opinion--Strong)

- b. Home modifications or additional assistance

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

- c. Admission to a medical facility if pain cannot be relieved or if complete rest is indicated

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

23. Place special emphasis on maintaining optimal range of motion during rehabilitation from upper limb injury.

(Clinical/epidemiologic evidence--2; Ergonomic evidence--NA; Grade of recommendation--B; Strength of panel opinion--Strong)

24. Consider alternative techniques for activities when upper limb pain or injury is present.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

25. Emphasize that the patient's return to normal activity after an injury or surgery must occur gradually.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

26. Closely monitor the results of treatment, and if the pain is not relieved, continued work-ups and treatment are appropriate.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

27. Consider surgery if the patient has chronic neuromusculoskeletal pain and has failed to regain functional capacity with medical and rehabilitative treatment

and if the likelihood of a successful surgical and functional outcome outweighs the likelihood of an unsuccessful procedure.

(Clinical/epidemiologic evidence--5/6; Ergonomic evidence--NA; Grade of recommendation--D; Strength of panel opinion--Strong)

28. Operate on upper limb fractures if indicated and when medically feasible.

(Clinical/epidemiologic evidence--6; Ergonomic evidence--NA; Grade of recommendation--D; Strength of panel opinion--Strong)

29. Be aware of and plan for the recovery time needed after surgical procedures.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

30. Assess the patient's use of complementary and alternative medicine techniques and beware of possible negative interactions.

(Clinical/epidemiologic evidence--6; Ergonomic evidence--NA; Grade of recommendation--D; Strength of panel opinion--Strong)

Treatment of Chronic Musculoskeletal Pain to Maintain Function

31. Because chronic pain related to musculoskeletal disorders is a complex, multidimensional clinical problem, consider the use of an interdisciplinary approach to assessment and treatment planning. Begin treatment with a careful assessment of the following:

- Etiology
- Pain intensity
- Functional capacities
- Psychosocial distress associated with the condition

(Clinical/epidemiologic evidence--1; Ergonomic evidence--NA; Grade of recommendation--A; Strength of panel opinion--Strong)

32. Treat chronic pain and associated symptomatology in an interdisciplinary fashion and incorporate multiple modalities based on the constellation of symptoms revealed by the comprehensive assessment.

(Clinical/epidemiologic evidence--1; Ergonomic evidence--NA; Grade of recommendation--A; Strength of panel opinion--Strong)

33. Monitor outcomes regularly to maximize the likelihood of providing effective treatment.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

34. Encourage manual wheelchair users with chronic upper limb pain to seriously consider use of a power wheelchair.

(Clinical/epidemiologic evidence--5/6; Ergonomic evidence--NA; Grade of recommendation--D; Strength of panel opinion--Strong)

35. Monitor psychosocial adjustment to secondary upper limb injuries and provide treatment if necessary.

(Clinical/epidemiologic evidence--None; Ergonomic evidence--NA; Grade of recommendation--NA; Strength of panel opinion--Strong)

Definitions:

Strength of Study Rating Schema (Clinical/Epidemiologic Evidence)

1. Systematic review (or meta-analysis) of randomized trials
2. Randomized clinical trial (RCT)
3. Systematic review (or meta-analysis) of observational studies (case-control, prospective cohort, and similar strong designs)
4. Single observational study (case-control, prospective cohort, or similar strong designs)
5. Case series, pre-post study, cross-sectional study, or similar design
6. Case study, nonsystematic review, or similar very weak design

Strength of Ergonomic Evidence

1. Strongly agrees with scientifically validated ergonomic principles
2. Somewhat agrees with scientifically validated ergonomic principles
3. Not supported by scientifically validated ergonomic principles

Rating Scheme for Strength of Recommendations (Grade of Recommendation)

Level A: Very Strong Support for Recommendation

- Multiple strong randomized controlled trials (RCTs) or a single strong systematic review of RCTs, and
- A great majority of studies in support of the recommendation, and
- Studies using subjects with SCI or results clearly applicable to SCI

Level B: Strong Support for Recommendation

- Single large, strong RCTs or strong systematic review of observational studies or multiple weak RCTs or multiple strong observational studies (case control or cohort) and
- A majority of studies in support of the recommendation and
- Studies using subjects with SCI or results clearly applicable to SCI or
- Strong ergonomic principles support (grade 1)

Level C: Intermediate Support for Recommendation

- Multiple case series, pre-post studies or weak case-control or cohort study or single weak RCT and

- Studies using subjects with SCI or results clearly applicable to SCI, or
- Studies listed under level A or B above, and
- Applicability of studies to SCI unclear or more than just a single study reported contrary findings, or
- Agreement with ergonomics literature somewhat (grade 2)

Level D: Weak Support for Recommendation

- Qualitative reviews, case studies, weak cross-sectional studies or very weak studies of other design and no ergonomic support (grade 3)

In addition, each recommendation has a "strength of panel opinion" rating. Panel members reviewed the literature, discussed recommendations among themselves and with other professional colleagues, reviewed field reviewer comments and suggestions, and based on that information and their clinical experience, independently rated each recommendation on a 1-5 scale, where 1 reflected disagreement and 5 strong agreement. The "strength of panel opinion" rating reflects the mean of the individual panel member ratings.

Levels of Panel Agreement with the Recommendations (Strength of Panel Opinion)

Low - Mean agreement score 1.0 to less than 2.33

Moderate - Mean agreement score 2.33 to less than 3.67

Strong - Mean agreement score 3.67 to 5.0

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified for each recommendation (see "Major Recommendations" field).

A list of references is provided in the original guideline document, which includes all sources used by the guideline development panel in support of the recommendations. The list provides the strength of scientific evidence (1-6) for each graded reference where applicable.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate management of upper limb pain and injuries in patients with spinal cord injury, resulting in decreased morbidity and improvement in quality of life

POTENTIAL HARMS

- Use of powered mobility may lead to weight gain and upper limb deconditioning. Ultimately these factors could lead to an increased risk of injury during transfers due to the need to lift more weight by a less conditioned limb.
- Risks of surgery and postoperative immobilization
- Side effects of pharmacotherapy

CONTRAINDICATIONS

CONTRAINDICATIONS

Nonpharmacological contraindications for opiate use include significant psychosocial distress or a history of drug abuse.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- This guideline has been prepared based on scientific and professional information available in 2004. Users of this guide should periodically review this material to ensure that the advice herein is consistent with current reasonable clinical practice.
- Recommendations in these guidelines to reduce the frequency of repetitive tasks should not be construed as advice to decrease all activity. There is evidence that suggests that more activity can prevent pain. Rather, the panel's intention is to inform patients how to "move smarter" while maintaining function and fitness. The panel feels strongly that attention to an overall program of health promotion and a wellness-oriented lifestyle that includes regular activity and/or exercise is important.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Consortium for Spinal Cord Medicine. Preservation of upper limb function following spinal cord injury: a clinical practice guideline for health-care professionals. Washington (DC): Paralyzed Veterans of America; 2005 Apr. 36 p. [149 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2005 Apr

GUIDELINE DEVELOPER(S)

Consortium for Spinal Cord Medicine - Private Nonprofit Organization

GUIDELINE DEVELOPER COMMENT

Consortium Member Organizations include: American Academy of Orthopedic Surgeons, American Academy of Physical Medicine and Rehabilitation, American Association of Neurological Surgeons, American Association of Spinal Cord Injury Nurses, American Association of Spinal Cord Injury Psychologists and Social Workers, American College of Emergency Physicians, American Congress of Rehabilitation Medicine, American Occupational Therapy Association, American Paraplegia Society, American Physical Therapy Association, American Psychological Association, American Spinal Injury Association, Association of Academic Physiatrists, Association of Rehabilitation Nurses, Christopher Reeve Paralysis Foundation, Congress of Neurological Surgeons, Insurance Rehabilitation Study Group, International Spinal Cord Society, Paralyzed Veterans of America, U.S. Department of Veterans Affairs, United Spinal Association

SOURCE(S) OF FUNDING

Paralyzed Veterans of America

GUIDELINE COMMITTEE

Guideline Development Panel

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Michael L. Boninger, MD (Panel Chair) (Physical Medicine and Rehabilitation) University of Pittsburgh, VA Pittsburgh Healthcare System, Pittsburgh, PA; Robert L. Waters, MD (Liaison to the Consortium Steering Committee and Topic Champion) (Orthopedic Surgery) Rancho Los Amigos Medical Center, Downey, CA; Theresa Chase, MA, ND, RN (SCI Nursing) Craig Hospital, Englewood, CO; Marcel P.J.M. Dijkers, PhD (Evidence-Based Practice Methodology) Mt. Sinai School of Medicine, New York, NY; Harris Gellman, MD (Orthopedic Surgery) Bascom Palmer Institute, Miami, FL; Ronald J. Gironda, PhD (Clinical Psychology) James A. Haley VA Medical Center, Tampa, FL; Barry Goldstein, MD (Physical Medicine and Rehabilitation) VA Puget Sound Health Care System, Seattle, WA; Susan Johnson-Taylor, OTR (Occupational Therapy) Rehabilitation Institute of Chicago, Chicago, IL; Alicia Koontz, PhD, RET (Rehabilitation Engineering) VA Pittsburgh Healthcare System, Pittsburgh, PA; Shari L. McDowell, PT (Physical Therapy) Shepherd Center, Atlanta, GA

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: May be downloaded from the [Paralyzed Veterans of America \(PVA\) Web site](#) for a nominal fee.

Print copies: Single copies available from the Consortium for Spinal Cord Medicine, Clinical Practice Guidelines, 801 18th Street, NW, Washington, DC 20006.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on August 8, 2005. The information was verified by the guideline developer on August 18, 2005.

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Date Modified: 9/25/2006

